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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/713,104

Applicant(s)

HAMANO ET AL.

Examiner

Raymond Alejandro

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03/24/09.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 10 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10 and 14-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

This action responds to applicant's submission filed on 03/24/09 which has been entered. The double patent rejection was overcome by the applicant due to the submission of the approved terminal disclaimer dated 03/24/09. None of the prior art rejections has been yet satisfactorily overcome by the applicant. Refer to the foregoing amendment for substance of applicant's rebuttal arguments and remarks. Thus, all pending claims remain rejected over the same grounds of rejection as composed infra on the written record:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 10 and 14-16 are rejected under 35 U.S.C. 102(c) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lampe-Onnerud et al 2002/0192552.

As to claims 1-4:

Lampe-Onnerud et al discloses a composition suitable for use as a cathode material of a lithium battery includes a core material having a first empirical formula; and a coating on the core. The coating and, optionally, the core (included as part of the cathode material) can be a material having a second empirical formula $\text{Li}_{x1}\text{A}_{x2}\text{Ni}_{1-y1-z1}\text{Co}_{y1}\text{B}_{z1}\text{O}_a$ wherein x_2 and z_1 each is greater than about 0.0 and equal to or less than about 0.2 (ABSTRACT, P0007-0008, 0047-0048); and A is at least one element selected from the group consisting of barium (Ba), among others; and B is at least one element selected from the group consisting of aluminum (Al), among others (ABSTRACT, P0007-0008, 0047-0048). *Therefore, the combination of the coating and the core reads on applicant's limitation requiring the amorphous phase of the oxide being dispersed within the particle (the core material having the second empirical formula) and/or formed in the surface of the particle (the coating on the core).*

As to claims 10 and 14-16:

Figure 1 depicts a lithium secondary battery comprising a positive electrode comprising the foregoing cathode material composition (P0053 & Figure 1).

Examiner's note: A 35 U.S.C. 102 /103 combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity". *Ex parte Lee*, 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993). With respect to the Ba content, it is noted that EXAMPLES 6-11 specifically uses Mg in the mol amount of 0.01. Since element A is least one element selected from the group consisting of barium (Ba), magnesium (Mg), among others, these two elements

can be interchangeably used in the aforementioned chemical formula, and thus, barium (Ba) can be used in that chemical formula in the same amount that magnesium (Mg) is used. In short, the mol amount of element A including barium (Ba) or magnesium (Mg), among others, in that chemical formula is 0.01 as instantly claimed. With respect to the Al content, the teachings of Lampe-Onnerud et al at once envisage using element B (i.e. Al or Mn) in amounts ranging from 0.0 to 0.05 as evidenced by EXAMPLES 6-15 wherein element B as represented by Mn (clearly interchangeable with Al) is employed in amounts closer to the lower limit of the disclosed range which is from about 0.0 and equal to or less than about 0.2. Furthermore, Lampe-Onnerud et al clearly envisages the use of any one of the elements A and elements B because both groups of elements A and B contain only a limited number of disclosed elements (i.e. elements A: a group of 4 elements; and elements B: a group of 7 elements).

Therefore, where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). In this case, Al constitutes the amorphous phase of the oxide.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-4, 10 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the European publication EP 0849817 (hereinafter 'the EP'817') as applied to claim 1 above, and further in view of Applicant's Admission of Prior Art (herein called the AAPA) (*See applicant's specification at pages 1-3*).

The above claims are directed to positive electrode material powder for a lithium secondary battery wherein the disclosed inventive concept includes the inclusion of an amorphous phase of oxide.

On the matter of claim 1:

The EP'817 makes known a positive active material for lithium battery including a Li-containing amorphous nickel oxide represented by a chemical composition formula of Li_xNiO_2 and which may further contain cobalt from 2-60 mol% (ABSTRACT/Page 2, Line 44-50) so as to have a chemical composition formula $\text{Li}_x\text{Ni}_{1-y}\text{M}_y\text{O}_2$ (Page 2, lines 45-50), or $\text{Li}_x\text{Ni}_{1-y}\text{Co}_y\text{M}_z\text{O}_2$ wherein M is at least one selected from the group consisting of Al, Si or P (Page 3, lines 5-10 and lines 50-58). **EXAMPLES 1-2** illustrate the powdery form of the resulting material. *Al, Si or P constitutes the amorphous phase of the oxide.*

(Emphasis added→) The EP'817 shows the use of $\text{Li}_x\text{Ni}_{1-y}\text{Co}_y\text{O}_2$ comprising phosphorus, silicon incorporated therein (Page 3, lines 55-55/Page 4, lines 1-6) and Al if necessary (Page 3, lines 56-58/Page 4, lines 1-6).

On the matter of claims 2-4:

Since the EP'817 discloses the formation of a Li-containing amorphous nickel oxide, it is noted that the specific particle dispersion and/or phase formation the surface of the particle is inherent to the amorphous phase formed in the positive active material thereof.

On the matter of claims 10 and 14-16:

The EP'817 discloses lithium battery including the disclosed positive active material (ABSTRACT).

The EP'817 describes a positive electrode material powder as disclosed above. However, the EP'817 neither explicitly discloses the Ba component nor the specific amount of the amorphous phase.

The AAPA presents different publications teaching positive electrode materials for lithium secondary batteries wherein the positive electrode material has a Li-Ni-Co-O or Li-Ni-Co-Ba-O system composition including specific compounds represented by chemical formulae $\text{Li}_{1-x-a}\text{A}_x\text{Ni}_{1-y-b}\text{B}_y\text{O}$ wherein A is one alkaline earth metal element such as Ba and x ranges from 0-0.10 and B is at least one transition metal element other than Ni; and/or $\text{Li}_{1-x-a}\text{A}_x\text{Ni}_{1-y-b}\text{B}_y\text{O}$ forming secondary particles wherein A may be Ba, and x ranges from 0.0 - 0.10 and B is at least one transition metal element (See applicant's specification at pages 1-3).

(**Emphasis added**→) JP reference 2001-173285 is part of the AAPA (See Applicant's specification at page 3, 1st full paragraph). Shown in **TABLE 2** therein is Comparative Example 1 which is Li-Ni-Co-Ba composition comprising a Ba mol ratio of 0.001 (See also the 11/16/07 amendment at page 5, 1st-2nd paragraphs).

Examiner's note: applicant further discloses that Ba, among other elements, allows easy formation of the amorphous phase of the oxide (See applicant's specification at page 4, last full paragraph); particularly, such arrangement allows the production of a positive electrode material for a Li-secondary battery having an amorphous phase of an oxide dispersed within a particle and also at a surface of each particle (See applicant's specification at page 6, last full paragraph, item-3); yet more particularly, applicant also discloses that a component for forming an amorphous phase of an oxide composed of one or plural elements selected from the group consisting of Ba, inter alia, is mixed at an extremely small amount of below 0.01 mol into Li-Ni-

Co-O system raw material (See applicant's specification at page 10, 1st full paragraph). That being said, since the positive electrode composition of the AAPA includes Ba in the same number of moles or molar range which allows easy formation of an amorphous phase of the oxide, it is contended that the presence of an amorphous phase of the oxide, as well as the specific particle dispersion and/or phase formation the surface of the particle are inherent to the specific composition of the positive active material of the AAPA. In short, element added to the positive electrode composition (i.e. Ba) and number of moles thereof in the AAPA's electrode fully circumscribes applicant's specific composition (in terms of material and molar amounts), therefore, the resulting electrode material of the AAPA also allows easy formation of amorphous phase thereof, thereby, it also exhibits the same degree of non-crystalline characteristic (amorphousness) as applicant's claimed positive electrode material.

By compounding the teachings of the prior art, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to add the Ba component of the AAPA to the amorphous positive electrode material of EP'817 as it is known in the art that that Ba, among other elements, allows easy formation of the amorphous phase of the oxide (See applicant's specification at page 4, last full paragraph); particularly, such arrangement allows the production of a positive electrode material for a Li-secondary battery having an amorphous phase of an oxide dispersed within a particle and also at a surface of each particle (See applicant's specification at page 6, last full paragraph, item-3). Thus, the addition of Ba to the amorphous material of the EP'817 enhances the amorphousness of that material.

If a technique has been used to improve one material or product (*adding a specific element such as Ba in the same claimed amount to electrode active materials*), and a person of

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ordinary skill in the art would recognize that it would improve similar materials or products in the same way (*another electrode active material*) using the known technique is obvious unless its actual application is beyond his or her skill. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007) & *KSR International Co. v. Teflex Inc.*, 550 US, 82 USPQ2d 1385 (2007). Stated differently, element Ba is familiar element, or features in this art, both individually and in combination, and the combination of these familiar element, or features with the electrode material of EP'817 according to known methods or techniques is likely to be obvious when it does no more than yield predictable results as here (*i.e., an effective electrode material with a high capacity*). *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007). If a person of ordinary skill can implement a predictable variation or obtain a predictable result or characteristic, 35 USC 103 likely bars its patentability. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007) & *KSR International Co. v. Teflex Inc.*, 550 US, 82 USPQ2d 1385 (2007).

With respect to the specific amount of the amorphous phase, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to make the chemical composition of the EP'817 by having the specific amount of amorphous phase (Al, Si, P content) as instantly claimed because although the disclosed amount in the EP'817 encompasses a broader range it is settled law that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a *prima facie* case

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of obviousness." *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). *See also In re Harris*, 409 F.3d 1339, 74 USPQ2d 1951 (Fed. Cir. 2005).

8. Claims 1-4, 10 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese publication JP 06-275277 (hereinafter 'the JP'277') as applied to claim 1 above, and further in view of Applicant's Admission of Prior Art (herein called the AAPA) (*See applicant's specification at pages 1-3*).

As to claim 1:

The JP'277 discloses a lithium secondary battery including a positive electrode body with a positive electrode active material containing Li, Co and phosphorous (ABSTRACT). A cobalt oxide including phosphate material (CLAIMS 1-2) forming an amorphous positive electrode material is further disclosed (P0009). Particle sizes (this, powder material) is the positive electrode material is disclosed (P0072, 0086). **Table 4** shows a positive electrode composition comprising at least **Li, Co, Ni, P in oxide forms** (See **TABLE 4**). The mol ratio of P in the oxide is at least 0.2 mol (P0009). *P constitutes the amorphous phase of the oxide.*

(Emphasis added→) A lithium cobalt oxide containing phosphorous is disclosed (CLAIM 1 of JP'277/P0004). A composition comprising $A_xB_yC_zD_wO_2$ wherein A is an alkali metal, B is a transition metal, C is at least Al, among others, and D is an alkali metal other than A (i.e. Na, K) is also disclosed (P0005). **TABLES 2 and 4** shows a lithium cobalt oxide also including Ni therein (See TABLE 2, 4 and P0075).

As to claims 2-4:

Since the JP'277 discloses the formation of a Li-containing amorphous materials in the form of oxides, it is noted that the specific particle dispersion and/or phase formation the surface of the particle is inherent to the amorphous phase formed in the positive active material thereof. As to claims 10 and 14-16:

The JP'277 discloses lithium battery including the disclosed positive active material (ABSTRACT).

The JP'277 describes a positive electrode material powder as disclosed above. However, the JP'277 neither explicitly discloses the Ba component nor the specific amount of the amorphous phase.

The AAPA presents different publications teaching positive electrode materials for lithium secondary batteries wherein the positive electrode material has a Li-Ni-Co-O or Li-Ni-Co-Ba-O system composition including specific compounds represented by chemical formulae $\text{Li}_{1-x-a}\text{A}_x\text{Ni}_{1-y-b}\text{B}_y\text{O}$ wherein A is one alkaline earth metal element such as Ba and x ranges from 0-0.10 and B is at least one transition metal element other than Ni; and/or $\text{Li}_{1-x-a}\text{A}_x\text{Ni}_{1-y-b}\text{B}_y\text{O}$ forming secondary particles wherein A may be Ba, and x ranges from 0.0 - 0.10 and B is at least one transition metal element (See applicant's specification at pages 1-3).

(*Emphasis added*→) JP reference 2001-173285 is part of the AAPA (See Applicant's specification at page 3, 1st full paragraph). Shown in **TABLE 2** therein is Comparative Example 1 which is Li-Ni-Co-Ba composition comprising a Ba mol ratio of 0.001 (See also the 11/16/07 amendment at page 5, 1st-2nd paragraphs).

Examiner's note: applicant further discloses that Ba, among other elements, allows easy formation of the amorphous phase of the oxide (See applicant's specification at page 4, last full

paragraph); particularly, such arrangement allows the production of a positive electrode material for a Li-secondary battery having an amorphous phase of an oxide dispersed within a particle and also at a surface of each particle (See applicant's specification at page 6, last full paragraph, item-3); yet more particularly, applicant also discloses that a component for forming an amorphous phase of an oxide composed of one or plural elements selected from the group consisting of Ba, inter alia, is mixed at an extremely small amount of below 0.01 mol into Li-Ni-Co-O system raw material (See applicant's specification at page 10, 1st full paragraph). That being said, since the positive electrode composition of the AAPA includes Ba in the same number of moles or molar range which allows easy formation of an amorphous phase of the oxide, it is contended that the presence of an amorphous phase of the oxide, as well as the specific particle dispersion and/or phase formation the surface of the particle are inherent to the specific composition of the positive active material of the AAPA. In short, element added to the positive electrode composition (i.e. Ba) and number of moles thereof in the AAPA's electrode fully circumscribes applicant's specific composition (in terms of material and molar amounts), therefore, the resulting electrode material of the AAPA also allows easy formation of amorphous phase thereof, thereby, it also exhibits the same degree of non-crystalline characteristic (amorphousness) as applicant's claimed positive electrode material.

By compounding the teachings of the prior art, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to add the Ba component of the AAPA to the amorphous positive electrode material of JP'277 as it is known in the art that that Ba, among other elements, allows easy formation of the amorphous phase of the oxide (See applicant's specification at page 4, last full paragraph); particularly, such

arrangement allows the production of a positive electrode material for a Li-secondary battery having an amorphous phase of an oxide dispersed within a particle and also at a surface of each particle (See applicant's specification at page 6, last full paragraph, item-3). Thus, the addition of Ba to the amorphous material of the JP'277 enhances the amorphousness of that material.

If a technique has been used to improve one material or product (*adding a specific element such as Ba in the same claimed amount to electrode active materials*), and a person of ordinary skill in the art would recognize that it would improve similar materials or products in the same way (*another electrode active material*) using the known technique is obvious unless its actual application is beyond his or her skill. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007) & *KSR International Co. v. Teflex Inc.*, 550 US, 82 USPQ2d 1385 (2007). Stated differently, element Ba is familiar element, or features in this art, both individually and in combination, and the combination of these familiar element, or features with the electrode material of the JP'277 according to known methods or techniques is likely to be obvious when it does no more than yield predictable results as here (*i.e., an effective electrode material with a high capacity*). *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007). If a person of ordinary skill can implement a predictable variation or obtain a predictable result or characteristic, 35 USC 103 likely bars its patentability. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007) & *KSR International Co. v. Teflex Inc.*, 550 US, 82 USPQ2d 1385 (2007).

With respect to the specific amount of the amorphous phase, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to make the chemical composition of the JP'277 by having the specific amount of

amorphous phase (P content) as instantly claimed because even though the amount of the JP'277's amorphous phase element does not overlap or lie inside the claimed range a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metal Corp. of America v. Banner* 227 USPQ 773 (Fed. Cir. 1985); *In re Woodruff* 16 USPQ 2d 1934 (Fed. Cir. 1990); *In re Aller* 105 USPQ 233 (CCPA 1955). Moreover, the normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine a satisfactory and optimum amount of material.

Response to Arguments

1. Applicant's arguments filed 03/24/09 have been fully considered but they are not persuasive.
2. With respect to applicant's argument concerning the molar range or amount of Ba in the composition of Lampe-Onnerud et al'552 having the empirical formula $\text{Li}_{x_1}\text{A}_{x_2}\text{Ni}_{1-y_1-z_1}\text{Co}_{y_1}\text{B}_{z_1}\text{O}_a$ wherein x_2 and z_1 each is greater than about 0.0 and equal to or less than about 0.2 (ABSTRACT, P0007-0008, 0047-0048); and A is at least one element selected from the group consisting of barium (Ba), among others; and B is at least one element selected from the group consisting of aluminum (Al), among others (ABSTRACT, P0007-0008, 0047-0048), applicant has NOT yet explained how the molar amount of Ba claimed in his/her invention CLEARLY and CONCRETELY differentiates from the molar amount x_1 which is greater than about 0.0 and equal to or less than about 0.2 in the material composition of Lampe-Onnerud et al'552. While applicant disputes the specific molar amounts in the disclosed examples, a point taken but not yet conceded by the examiner, applicant has conveniently overlooked the general teaching of

Lampe-Onnerud et al'552 which directly shows to substitute element A which can be Ba in the claimed formula and in a range encompassing the claimed molar amount. In short, applicant has failed to provide a reasonable statement to obviate or discard such a teaching. The examiner remains unconvinced about eliminating, discarding, overlooking or obviating such a direct teaching found in Lampe-Onnerud et al'552.

3. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. (*emphasis added*→) Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Moreover, the claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Stated differently, simple substitution of one known, equivalent element for another to obtain predictable results is prima-facie obvious. *KSR International Co. v. Teleflex Inc.*, 550 US-82 USPQ2d 1385, 1396 (2007). Stated differently, barium, cobalt, nickel, aluminum and magnesium and the likes are familiar elements, materials or compositions in the art, both

individually and in combination, and the combination of these familiar elements, materials or compositions with the electrode materials of any one of the cited prior art references according to known methods or techniques is likely to be obvious when it does no more than yield predictable results as here (i.e., an effective electrode material). *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007).

4. The ONLY line of contention of applicant's arguments is premised on the assertion that "the results tabulated in Table 2, Examples 1-4, 7-8, 10 and 18-19, and Table 3, Examples 11-12, 14 and 12" are fully applicable to the claimed composition or electroactive powder, and that "the Examiner considers ALL of the results in TABLES 1-4 of applicant's specification when considering the amendments". All things, data, information and compositions considered, the examiner states that ALL of the specific compositions in TABLES 1-4 include WELL-DEFINED molar amounts which are not currently claimed in the claims in question. Thus, those compositions are *not commensurate* in scope with the presently claimed positive electrode material. Thus, specific superior results inherent associated with each and every particular cathode active material composition shown in TABLES 1-4 are inapplicable and not extendable to the unlimited and compositionally undefined cathode materials of the present claims.

The applicant also argues that any inference of obviousness is rebutted by a showing of unexpected results. (*See the 11/130/08 amendment: Remarks*). In support of his(their) argument, the applicant refers to the compositions tabulated in TABLES 1-4, in particular, Tables 2-3, in the subject application, and certain specific examples associated with the foregoing compositions (results shown in Tables 1-4 at pages 19-22) of the specification. Having reviewed the showing in the subject specification, the examiner determines that the applicant has not demonstrated that the claimed subject matter as a whole imparts unexpected results. *In re Klosak*, 455 F.2d 1077, 1080, USPQ (CCPA 1972)(*The appellants have the burden of showing that the claimed subject matter imparts unexpected results.*); *In re Heyna*, 360 F.2d 222, 228, 149 USPQ 692, 697 (CCPA 1966) (“ it is incumbent upon appellants to submit clear and convincing evidence to support their allegation of unexpected property.”).

That is to say, the tabulated results (compositions and respective results) are not commensurate in scope with the instant claims. For instance, the cathode active materials and batteries supposedly representative of the claimed invention referred to in the subject specification are limited to employing *a positive electrode made of specific amounts of, in different combinations, lithium, nickel, cobalt, barium, aluminum, sodium, potassium, phosphorous, silicon and specific amounts of acetylene black and polyvinylidene fluoride and the like additives under specific production environments and an electrolyte formed of dissolved Li-salts with a specific organic solvent*. Although these exemplified cathode active materials and batteries appear to show some improvement in performance, the applicant has not provided any evidence, much less any explanation, as to why this limited showing is sufficient to support, for example, the multifarious *positive electrode materials* made of materially different or undefined amounts of the foregoing components and additional components included or not included in the claims under examination. This is especially true in this case since the applicant's own specification indicates that the specific amounts of the aforementioned components used, as well as the presence or absence of other components, affect the performances of the cathode active material and respective battery. See the examples in TABLES 1-4 at pages 19-22 of the specification. Thus, it cannot be said that the applicant has carried their burden of showing that the claimed subject matter as a whole imparts unexpected results, thereby rebutting the prima facie case established by the examiner.

5. With respect to applicant's arguments concerning the disclosure of the EP'817 reciting "*wherein M is at least one of Mn, Al, P, B and S, and z is greater than 0 and less than 1*" (i.e. using an amorphous phase mol ratio of Al, P ranging from 0 to 1) and thus, a range broader than

the claimed range of "*less than 0.01 mol ratio but more than 0*", it is noted that settled law stipulates the following: in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness." In re Peterson, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). See also In re Harris, 409 F.3d 1339, 74 USPQ2d 1951 (Fed. Cir. 2005). MPEP 2144.05 Obviousness of Ranges.

6. With respect to applicant's arguments concerning the disclosure of the JP'277 using "*a mol ratio of phosphorous in excess of 0.2 mols*" and thus, outside the claimed range of "*less than 0.01 mol ratio but more than 0*", it is noted that settled law stipulates the following: a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metal Corp. of America v. Banner* 227 USPQ 773 (Fed. Cir. 1985); *In re Woodruff* 16 USPQ 2d 1934 (Fed. Cir. 1990); *In re Aller* 105 USPQ 233 (CCPA 1955). Moreover, the normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine a satisfactory and optimum amount of material. MPEP 2144.05 Obviousness of Ranges.

7. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the

time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

8. With respect to applicant's arguments regarding the admitted prior art, where the specification identifies work done by another as "prior art," the subject matter so identified is treated as admitted prior art. In *re Nomiya*, 509 F.2d 566, 571, 184 USPQ 607, 611 (CCPA 1975). A statement by an applicant in the specification or made during prosecution identifying the work of another as "prior art" is an admission which can be relied upon for both anticipation and obviousness determinations, regardless of whether the admitted prior art would otherwise qualify as prior art under the statutory categories of 35 U.S.C. 102. *Riverwood Int'l Corp. v. R.A. Jones & Co.*, 324 F.3d 1346, 1354, 66 USPQ2d 1331, 1337 (Fed. Cir. 2003); *Constant v. Advanced Micro-Devices Inc.*, 848 F.2d 1560, 1570, 7 USPQ2d 1057, 1063 (Fed. Cir. 1988).

9. With respect to the rejections under Section 103, applicant has argued that neither the EP'817 nor the JP'277 disclose the specific claimed amount of Ba in the positive active material powder. In reply, it is asserted that the above-mentioned references are combined with the AAPA as a secondary reference to account for that deficiency.

In this regard, the AAPA presents different publications teaching positive electrode materials for lithium secondary batteries wherein the positive electrode material has a Li-Ni-Co-O or Li-Ni-Co-Ba-O system composition including specific compounds represented by chemical formulae $\text{Li}_{1-x-a}\text{A}_x\text{Ni}_{1-y-b}\text{B}_y\text{O}$ wherein A is one alkaline earth metal element such as Ba and x ranges from 0-0.10 and B is at least one transition metal element other than Ni; and/or Li_{1-x} .

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$aA_xNi_{1-y}bB_yO$ forming secondary particles wherein A may be Ba, and x ranges from 0.0 - 0.10 and B is at least one transition metal element (*See applicant's specification at pages 1-3*).

(*Emphasis added*→) JP reference 2001-173285 is part of the AAPA (See Applicant's specification at page 3, 1st full paragraph). Shown in **TABLE 2** therein is Comparative Example 1 which is Li-Ni-Co-Ba composition comprising a Ba mol ratio of 0.001 (See also the 11/16/07 amendment at page 5, 1st-2nd paragraphs). Thus, applicant admits the JP'285 teaches the use of Ba in the same claimed amount or mole ratio.

As a result, the AAPA shows to use Ba in the claimed amount to obtain a high capacity electrode active material for a secondary battery.

Therefore, the combined prior art does show, teach or suggest the claimed composition including the specific Ba amount and elements as instantly claimed by the applicant.

10. In a relevant statement, the Examiner now adds the following precedent determination to further support the here presented prima-facie cases of obviousness:

If a technique has been used to improve one material or product (*adding a specific element such as Ba in the same claimed amount to electrode active materials*), and a person of ordinary skill in the art would recognize that it would improve similar materials or products in the same way (*another electrode active material*) using the known technique is obvious unless its actual application is beyond his or her skill. *See KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007) & *KSR International Co. v. Teflex Inc.*, 550 US, 82 USPQ2d 1385 (2007).

Stated differently, element Ba is familiar element, or features in this art, both individually and in combination, and the combination of these familiar element, or features with the electrode material of either EP'817, the JP'277 or Kobayashi et al according to known methods or

techniques is likely to be obvious when it does no more than yield predictable results as here (*i.e., an effective electrode material with a high capacity*). See *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007).

If a person of ordinary skill can implement a predictable variation or obtain a predictable result or characteristic, 35 USC 103 likely bars its patentability. See *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (U.S. 2007) & *KSR International Co. v. Teleflex Inc.*, 550 US, 82 USPQ2d 1385 (2007).

11. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). *In responding to the rejections under Section 103 above, applicant is constantly relying upon the assertion that each reference alone, singly or individually does not teach the claimed subject matter as a whole. Such a response is inappropriate under the 103 analysis set forth by the Examiner.*

12. In the event that applicant alleges the presence of unexpected results based on the results tabulated in applicant's TABLE 2 and Examples 1-4, 7-8, 10, 18 and 19; and TABLE 3, Examples 11-12, 14 and 16, it should be noted that none of applicant's examples apply to the subject composition and are commensurate in scope with the present electrode active powder because neither example does include element O in its total composition. Hence, they DO NOT represent an amorphous phase of an oxide as recited in the invention at issue. Therefore, the results or characteristics associated with all of these examples are irrelevant and do not matter to the presently claimed composition.

The following Examiner's response to applicant's arguments is maintained herein, for the reasons of record, to support the amorphousness phase of the AAPA electrode material because this point was originally challenged by the Applicant:

With respect to the teachings of the AAPA, the examiner has carefully evaluated and analyzed the entire body of arguments advanced by the applicant but they are still deemed to be insufficient to overcome that rejection. In essence, applicant has articulated that “*the AAPA does not teach or suggest that each particle which constitutes the powder has an amorphous phase of an oxide*”, and “*the conclusion in the Office Action that it is contended that the presence of an amorphous phase of the oxide, as well as the specific particle dispersion and/or phase formation the surface of the particulate are inherent to the specific composition of the positive active material of the AAPA is incorrect as a matter of law*” and “*the specification specifically demonstrates that these properties in fact are not inherent in all particles*”. Much more importantly is applicant's own statement that “*the AAPA is completely silent with respect to whether the particles have an amorphous phase of an oxide or not*” (See 04/12/07 amendment on page 8, 3rd full paragraph). From this statement, it is immediately clear that applicant himself is not completely sure that the AAPA does or does not disclose the claimed characteristics. This is exactly what supports the ground of rejection based upon anticipation/obviousness. Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function or characteristic is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102/103. The burden of proof is on applicant *In re Fitzgerald*, 619 F.2d 67, 70, 205

USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). See MPEP 2112.

ONCE A REFERENCE TEACHING PRODUCT APPEARING TO BE SUBSTANTIALLY IDENTICAL IS MADE THE BASIS OF A REJECTION, AND THE EXAMINER PRESENTS EVIDENCE OR REASONING TENDING TO SHOW INHERENCY, THE BURDEN SHIFTS TO THE APPLICANT TO SHOW AN UNOBVIOUS DIFFERENCE.

“[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency’ under 35 U.S.C. 102, on prima facie obviousness’ under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted].” The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). *See MPEP 2112.*

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). “*When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.*” *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily

possess the characteristics of the claimed product. *In re Best*, 562 F.2d at 1255, 195 USPQ at 433. See also *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). See **MPEP 2112**.

Accordingly, the examiner also asserts that it is not enough that applicant's representative personally believes that the prior art does not show or teach such inherently identified characteristic(s). That is to say, the arguments of counsel cannot take the place of evidence in the record. An assertion of what seems to follow from common experience is just attorney argument and not the kind of factual evidence that is required to rebut a prima facie case of inherent anticipation/obviousness (See **MPEP 716.01 and 2145: Consideration of Applicant's Rebuttal Arguments**).

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Raymond Alejandro/
Primary Examiner, Art Unit 1795